

high efficiency power amplifier, etc., f) Network Interface Unit (NIU) providing wireline network connection for the said integrated terminal.

2. A system as recited in claim 1 wherein said Wireless LAN and Wireless PAN are operative on a short range frequency.

3. A system as recited in claim 1 wherein said SDM unit is a portable open module containing parameters, algorithms, protocols of different wireless air interfaces.

4. A system as recited in claim 1 wherein said RF/IF Subsystem is a portable open RF radio unit supporting different RF requirements of different wireless standards.

5. A method of the integrated communication terminal supporting multiple network access capabilities, said method comprising: a) establishing communication between the said integrated terminal and the Mobile Switching Center (MSC), as utilized hereinafter, through IP connection when the wired network is available for the said integrated terminal, b) establishing communication between the said integrated terminal and the said MSC via the said Wireless LAN or said Wireless PAN through IP connection when the wired network is not available, but the said Wireless LAN or said Wireless PAN is available for the said integrated terminal, c) connecting the said integrated terminal to the specific base station over the mobile cellular air-link channel when both the wired network and the short range wireless access networks (including said Wireless LAN and said Wireless PAN) are not available for the said integrated terminal.

6. A method as recited in claim 5 comprising reporting the "Visitor IP address" of the said integrated terminal to the said MSC when the IP connection is established. Said "Visitor IP Address" is changed when said integrated terminal moves to different access location of wireline network (or through said short range Wireless LAN/Wireless PAN to the wireline network), and accordingly this said "Visitor IP Address" is dynamically updated in the said MSC of the user registration.

7. A method as recited in claim 5 comprising utilizing a static mobile cellular air-link channel or a dynamically assigned mobile cellular air-link channel to optimize the wireless spectrum utilization.

8. A method as recited in claim 5 comprising searching for available network accesses based on pre-defined search criteria and priority order set by the user.

9. An integrated communication infrastructure for next generation mobile telecommunications said system comprising: a) a Mobile Switching Center (MSC) or Mobile Gateway capable of connecting the mobile communication networks with the wireline backbone core networks, b) a Virtual Mobile Server supporting the said integrated terminal of value-added communication services and applications, as well as related system management of the said integrated terminal.

10. A method of the integrated communication infrastructure supporting incoming call processing management capabilities in the said MSC, said method comprising: a) searching the Connection Table for the network access status of the said integrated terminal, b) establishing communication between the said MSC and the said integrated terminal through IP connection when the said Visitor IP address is available in the said Connection Table, c) forwarding to the related base station to establish communication between the said base station and the said integrated terminal over the

mobile cellular air-link channel when the said Visitor IP address is not available, but the address of the said mobile cellular air-link channel is available in the said Connection Table, d) forwarding to the said Virtual Mobile Server by the Home IP address for further processing, for example, mobile secretary or voice mail, etc if none of the above said addresses is available.

11. A method as recited in claim 10 comprising establishing IP connection with the said integrated terminal through a fully wired network or the combination of wired network and the said Wireless LAN/Wireless PAN, wherein the said Wireless LAN/Wireless PAN is in the short range local access area of the said integrated terminal.

12. A method as recited in claim 10 comprising supporting various service calls including data service and voice service, wherein the Voice-over-IP technology or future technology is utilized.

13. A system as recited in claim 9 wherein said Virtual Mobile Server comprising: a) service function capabilities including mobile secretary, mobile office, voice mailbox, Short Message Service (SMS) and Multimedia Message Service (MMS) and information center, etc., b) special services management capabilities including location management, security and safety management, access optimization, and operation and maintenance management, etc., c) said SDM modules' center providing on-line secured Internet downloading for the said integrated terminal, d) a mobile connection table containing the most updated information of said "Visitor IP Address" of said integrated terminal which is "On-Line" of IP connection.

14. A system as recited in claim 9 wherein said Virtual Mobile Server can be any computer server with Internet connection, and with a fixed IP address, called Home IP Address.

15. A system as recited in claim 9 wherein one said Virtual Mobile Server can support one or multiple said integrated terminals, wherein many such said integrated terminals can share same said Virtual Mobile Server.

16. A system as recited in claim 9 wherein said MSC can be replaced with a Mobile Gateway or simply a mobile network access equipment connecting with the backbone core network as defined in different or future communication and network infrastructure.

17. A method as recited in claim 5 comprising frequently searching for the higher priority network access mode whenever the connection is in the low priority mode to optimize the network access control and maximize the broadband services.

18. A prototype integrated wired and wireless terminal system for said integrated terminal, said system comprising: a) "Connection Mode" function supporting wired USB (universal serial bus) or Cable interface, said Wireless LAN, said Wireless PAN, multiple mobile cellular standards (for example, cdma2000, WCDMA, GSM, TD-SCDMA, OFDM) and other user defined wireless standards, b) "Service Mode" function supporting voice, data, video and user-defined service, c) "Input Mode" function supporting keyboard input, information recognition (including voice recognition and text recognition), Bluetooth/UWB (Ultra Wide Band) wireless input and other user defined method, d) said SDM Interface Slot supporting various wireless standards modules and system testing modules, etc., e) said NIU port supporting wireline networking capability, f) shortcut